

MICHAEL McGUIRE, PhD, VOLUME I, 3-18-09

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IN THE UNITED STATES DISTRICT COURT FOR THE
NORTHERN DISTRICT OF OKLAHOMA

W. A. DREW EDMONDSON, in his)
capacity as ATTORNEY GENERAL)
OF THE STATE OF OKLAHOMA and)
OKLAHOMA SECRETARY OF THE)
ENVIRONMENT C. MILES TOLBERT,)
in his capacity as the)
TRUSTEE FOR NATURAL RESOURCES)
FOR THE STATE OF OKLAHOMA,)

Plaintiff,)

vs.)

4:05-CV-00329-TCK-SAJ

TYSON FOODS, INC., et al,)

Defendants.)

VOLUME I OF THE VIDEOTAPED
DEPOSITION OF MICHAEL McGUIRE, PhD, produced
as a witness on behalf of the Plaintiff in the above
styled and numbered cause, taken on the 18th day of
March, 2009, in the City of Tulsa, County of Tulsa,
State of Oklahoma, before me, Kristen Holmes, a
Certified Shorthand Reporter, duly certified under
and by virtue of the laws of the State of Oklahoma.

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EXHIBIT

2

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1 some. I had been working with a number of younger
2 engineers, and I had -- I felt like I had really
3 been able to see them off on their own on the rest
4 of their careers, and so I really got to the point
5 where I -- I wanted to simplify my life, and so I
6 opened up a one-man consulting operation and
7 complicated my life.

03:02PM

8 Q And do you have -- other than the work that
9 you're doing in this litigation, do you have other
10 clients?

03:02PM

11 A Yes.

12 Q Does the work that you're doing for those
13 clients, again, relate to drinking water supplies?

14 A Yes.

15 Q Anything else?

03:02PM

16 MR. JORGENSEN: Sorry. It took me just a
17 second to -- to get myself gathered there. Object
18 to form as to -- as to the question anything else.

19 A Drinking water quality and treatment is what
20 everything is related to.

03:02PM

21 Q Okay. Did you consult with anybody when you
22 revised your areas of expertise and research
23 interests?

24 A No.

25 Q Are you a limnologist?

03:03PM

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1 A Oh, no, I am not.

2 Q Do you consider yourself to be a watershed
3 modeler?

4 A No.

5 Q What about a toxicologist?

03:03PM

6 A Definitely not.

7 Q Epidemiologist?

8 A Most assuredly, no.

9 Q Do you have any medical training?

10 A No.

03:03PM

11 Q Have you worked with EPA water quality
12 standards?

13 A Yes.

14 Q Surface water quality standards?

15 A Yes.

03:03PM

16 Q Would you consider yourself to be an expert in
17 surface water quality standards?

18 A Yes.

19 Q Do surface water quality standards different

20 -- differ between states?

03:04PM

21 A They do, although less these days than in
22 years past. Most states now simply adopt EPA

23 regulations by reference. That is, indeed, what

24 Oklahoma has done, and, therefore, there's a much

25 greater consistency to regulations than there has

03:04PM

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1 supposed to do that. I was -- I was only concerned
2 about my notes.

3 Q Did you gather up all of the materials that
4 were relied on or considered by people who assisted
5 you in the drafting of this report?

05:41PM

6 A Yes. As I said, the -- the only section that
7 I received any assistance on for drafting was the
8 cyanotoxin section, and there are a number of
9 articles and references on that in the CD that I
10 produced.

05:41PM

11 Q Did you collect the e-mails -- any e-mails
12 related to this report that -- of Nicole Blute?

13 A No, I didn't.

14 Q Anybody else that worked on the report, did
15 you gather their e-mails?

05:42PM

16 A Only, I think, the ones from the guy who did
17 the statistics evaluation, the Mann and Whitney U.
18 His name is -- I'm not remembering. He's with the
19 Newport News office of Malcolm Pirnie. I'm pretty
20 sure those e-mails are in there.

05:42PM

21 Q Okay. Who -- who was that gentleman?

22 A I'm trying to remember. Oh, actually he'll be
23 in that invoice. Clifton Bell.

24 Q What did he do in this case?

25 A I provided five or six, I guess, datasets,

05:43PM

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1 data comparisons of trihalomethane, haloacetic acid,
2 TOC data and asked him to evaluate whether or not we
3 could use parametric or non-parametric statistics to
4 compare means or determine if these datasets were
5 from the same population or not, and the results of
6 that are included in my -- my expert report.

05:43PM

7 Q You're going to have to help me with that.

8 A Okay.

9 Q You asked him whether or not you could do
10 parametric or non-parametric statistical analysis?

05:43PM

11 A Yes.

12 Q And what was his answer?

13 A His answer was to use non-parametric
14 statistics because of the way the data was
15 distributed, and that's why he chose what's called
16 the Mann-Whitney U test, which was what was
17 conducted on these six data pairs.

05:44PM

18 Q Did he actually do the statistical analysis?

19 A Yes, he did.

20 Q Why didn't you do the statistical analysis?

05:44PM

21 A I can do it. I'm decent --

22 MR. JORGENSEN: Bless you.

23 A -- decent at statistics, but not an expert.

24 He is far better than I am and keeps up with it on a
25 daily basis. So I wanted to be absolutely certain

05:44PM

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1 that we were using the right statistical test.

2 Q What was the nature of -- what was it about
3 the nature of the -- the data that you wanted to
4 compare statistically that made the non-parametric
5 analysis more appropriate?

05:45PM

6 A In order to use parametric statistics, the
7 data has to be distributed normally, which means
8 like a bell curve. Like most environmental data,
9 this data was skewed or shifted to the left towards
10 where the detection limit is, and that's always a
11 problem with environmental data, and, as a result,
12 we even tried various transformations, including log
13 transforms, square root transforms. Nothing really
14 panned out, and we just realized that, even though
15 we would prefer to use the simple mean-standard
16 deviation t-test that everybody knows from
17 parametric statistics, it was just more correct to
18 -- to use a non-parametric statistical test.

05:45PM

19 Q What does it mean when -- when data is skewed
20 to the left?

05:46PM

21 A If you draw a bar chart --
22 MR. JORGENSEN: Objection.

23 A -- diagram of the -- the frequency -- the
24 relative frequency of the data, it -- it forms a
25 curve typically, and the bell-shaped curve is what

05:46PM

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1 datasets in that it describes differences that are
2 not really relevant. In other words, you're --
3 you're finding differences that are very small that
4 don't have any meaning in the world, and so you have
5 to be careful as you interpret these just when the
6 statistical test tells you that something is
7 different because these datasets are so huge, and
8 that does affect the power of -- what's called the
9 power of the test and how it comes up with answers.

05:55PM

10 You -- you have to take -- you have to use
11 engineering judgment, scientific judgment in order
12 to determine whether or not the difference that is
13 being described by the statistical test is -- is
14 reasonable.

05:55PM

15 Q And did you make that judgment with regard to
16 the statistical analysis that was done in this case?

05:55PM

17 A Yes.

18 Q Did you have any discussion with Clifton Bell
19 about comparing two sample sets that are very
20 different in terms of the number of the
21 observations?

05:56PM

22 A Yes, I did. Specifically that question was
23 asked, and his answer was because these numbers are
24 -- the N numbers, the numbers in both sets, even
25 though they're quite different, they're so large

05:56PM

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1 that there wasn't any kind of a problem with that
2 comparison.

3 Q Have you ever done anything like that before?

4 A Nothing quite like this. Like I said, usually
5 when I'm trying to do a statistical analysis, I've
6 got maybe six or ten data points I'm trying to
7 compare, not thousands. So it's a -- it's a whole
8 new realm of -- of statistical concerns, which is
9 one of the reasons why I consulted with Clifton
10 because he has done this before.

05:56PM

05:56PM

11 Q Had Clifton compared datasets of this size
12 before?

13 A I didn't ask him that specifically. He sure
14 didn't seem surprised, though. He -- he seemed like
15 he knew what he was talking about.

05:57PM

16 Q Have you reviewed all of the plaintiffs'
17 experts' reports in this case?

18 A I confess, no, I have not.

19 Q I apologize for doing this to you, but which
20 ones have you reviewed?

05:57PM

21 A I can tell you the ones that I have spent the
22 most time on and read not once, but many times.
23 That includes Cooke -- Cooke and Welch, Teaf and
24 King, which are really central to the questions that
25 I was asked to cover on drinking water quality and

05:58PM

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State of Oklahoma, before me, Kristen Holmes, a
Certified Shorthand Reporter, duly certified under
and by virtue of the laws of the State of Oklahoma.

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1 productivity in the reservoir by algae and the
2 production of DBPs for the many reasons I go into,
3 which goes on for pages and pages, I'm sorry to say,
4 which talks about the many sources of organic carbon
5 and how it's difficult, if not impossible, to
6 distinguish between the relative sources and what
7 ends up in the water once chlorine is then added.

08:16AM

8 Q And -- and my question just goes to -- to Lake
9 Tenkiller, and -- and is algae one of the sources in
10 Lake Tenkiller that contributes to the TOC levels?

08:16AM

11 A It's one of the potential sources.

12 Q Do you know one way or the other whether it is
13 an actual source?

14 A No one knows, and I don't know for certain.

15 Q When you -- excuse me. I'll start over. Does
16 the algae in the raw water in Lake Tenkiller react
17 with chlorine during treatment to produce
18 disinfection byproducts?

08:17AM

19 A It's possible that that can happen. Nothing
20 has been demonstrated that it has happened in Lake
21 Tenkiller.

08:17AM

22 Q Why wouldn't it in Lake Tenkiller?

23 A There are any number of reasons why it
24 wouldn't. The algae is not getting to the treatment
25 plant. The algae is removed before any chlorine is

08:17AM

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1 me. New epidemiology and toxicology studies
2 evaluating bladder, colon and rectal cancers have
3 increased the weight of evidence linking these
4 health effects to DBP exposure.

5 Q Do you know what -- what EPA means there when 09:09AM
6 they are speaking about the weight of the evidence?

7 MR. JORGENSEN: Objection.

8 A We've already talked about that a bit. It's
9 part of the health assessment methodology that is
10 used by toxicologists in EPA to assess the health 09:09AM
11 risks associated with these compounds. I don't know
12 the exact details of it since I'm not a
13 toxicologist.

14 Q Okay.. There's another paragraph highlighted
15 on that same column on that page. Would you mind 09:09AM
16 reading that into the record?

17 A All Stage 1 DBPR is predicted to provide a
18 major reduction in DBP exposure. National survey
19 data suggests that some customers may receive
20 drinking water with elevated or peak DBP 09:09AM
21 concentrations even when their distribution system
22 is in compliance with the Stage 1 DBPR. Some of
23 these peak concentrations are substantially greater
24 than the Stage 1 DBPR maximum contaminant levels,
25 MCLs, and some customers receive these elevated 09:10AM

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1 Q So if the MCLG is exceeded, is there risk to
2 human health from the person who's exposed to the
3 water that is -- exceeds the MCLG?

4 MR. JORGENSEN: Objection.

5 A You're asking me a health risk question.

09:20AM

6 Q Uh-huh.

7 A And I've stated pretty clearly that I'm not a
8 toxicologist. So I think it's clear that I don't
9 have an expert opinion on that..

10 Q Okay. If the EPA establishes an -- an MCLG
11 for a contaminant, does that mean that the
12 contaminant is -- is -- may have an adverse effect
13 on the health of -- of persons?

09:20AM

14 MR. JORGENSEN: Objection.

15 A That's the definition, yes.

09:21AM

16 Q Do you know which DBPs there are MCLGs for --

17 A Not --

18 Q -- established?

19 A I don't have them memorized. They're listed
20 in the rule.

09:21AM

21 Q Okay. Do you know whether there is, just from
22 your memory, an MCLG for chloroform?

23 A The MCLGs have changed dramatically over the
24 last 25 years, and so the numbers have changed,
25 those that have MCLGs have changed, and I -- I would

09:21AM

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1 A The two lowest levels -- average levels for
2 TOC in the watershed include Adair County and Flint
3 Ridge. So those are in the riverine portion of the
4 watershed. Tahlequah is on the low end of levels
5 that are in the rest of the lake. So it appears
6 from the data that the TOC values for the -- at
7 least two of the three riverine utilities are lower
8 than those in the lake.

10:24AM

9 Q Okay. On Page 24, is this the -- let me get
10 there -- statistical analysis or at least one of the
11 statistical analysis we discussed yesterday?

10:25AM

12 A Yes.

13 Q And this was -- I apologize. I can't remember
14 the gentleman's name.

15 A Clifton Bell.

10:26AM

16 Q Clifton Bell, he did this analysis?

17 A Yes.

18 Q Is this a comparison of data for U.S.
19 utilities based on the ICR data, which I believe we
20 discussed yesterday, and the TOC data for Illinois
21 River watershed utilities?

10:26AM

22 A Yes.

23 MR. JORGENSEN: Objection.

24 Q The -- the number of observations here of 719
25 -- and I think we discussed this maybe already --

10:26AM

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1 does this exclude any values which were above five
2 which you did not include in your average analysis?

3 A Yes. It excludes all values that I thought
4 were outliers and not representative of the levels
5 in the -- the watershed.

10:27AM

6 Q Okay, and the value or number of observations
7 for the U.S. utilities based on ICR, is that all of
8 the available values or did you select a subset?

9 A No. That was all of the available values.

10 There was just a tremendous amount of QA/QC on this
11 data out of -- I don't know -- five or six different

10:27AM

12 levels, and so the whole point was to create data
13 that did not have some of the problems that we're
14 experiencing by looking at the IRW utilities. So
15 none of that data was excluded.

10:27AM

16 Q Okay. Is this data that is included in this
17 number from large utilities or utilities that are of
18 any size?

19 A The ICR was only conducted for those utilities
20 serving greater than a 100,000 population.

10:28AM

21 Q Were there any facilities included in here
22 that were located in Oklahoma?

23 A Yes, water supplies for Tulsa and Oklahoma
24 City.

25 Q Are you familiar with the water sources for --

10:28AM

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1 last paragraph, a recent publication.

2 A Okay.. A recent publication on precisely this
3 topic showed that little or no progress has been
4 made demonstrating a definitive connection between,

5 yes, controlling algae and reducing THMs, yes, and I

02:23PM

6 quote -- let's call it Bukaveckas. I quote his --

7 part of his article on Page 50, and really the focus

8 of the quote is that scientific understanding of the

9 links between watershed development and DBPs is

10 poor, and that's really -- supports my expert

02:23PM

11 opinion that it is essentially impossible to

12 separate out the -- from the TOC molecules what is

13 -- what's coming from what, and if you can't

14 identify definitively what the sources are, you

15 can't specify control measures to reduce those

02:23PM

16 levels.

17 Q Would you turn to Page 128 of that article?

18 A I'm there.

19 Q About halfway down the -- the first paragraph

20 there's a sentence that starts with evidence in

02:23PM

21 support.

22 MR. JORGENSEN: On which column? The first
23 column?

24 MS. BURCH: The first column.

25 A I'm there. Evidence in support of the

02:24PM

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1 A Essentially means organics that are generated
2 within, in other words, in this particular case
3 within a reservoir by algal productivity.

4 Q Can you turn to Page 135 of this paper?

5 MR. JORGENSEN: I renew my objection -- 02:25PM
6 objection. I think it's all out of context without
7 reading that second column.

8 MS. BURCH: Okay.

9 Q Do you -- do you see a sort of a conclusion of
10 this article entitled implications? 02:25PM

11 A Yes.

12 Q Could you read the -- the sentence right after
13 implications into the record?

14 A Could I read what? I'm sorry.

15 Q The sentence right after the word implications 02:25PM
16 into the record.

17 A Oh, okay. The findings of this study have
18 implications for water providers and reservoir
19 managers that may be generally applicable to
20 thermally stratified reservoirs situated in 02:25PM
21 agricultural landscapes. Continue?

22 Q Yes.

23 A Well, the first bullet -- I'm sorry. I'm
24 going to have to do a paper review here. The first
25 bullet is completely absurd. First, THM formation 02:26PM

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1 potential was largely associated with the dissolved
2 fraction, suggesting that filtration to remove
3 particulates would have little influence on
4 precursor concentrations. How in the world did this
5 get published? Obviously you change dissolved
6 organic matter into particulate through coagulation,
7 and then you filter it. So that's --

02:26PM

8 Q So you disagree with that conclusion?

9 A It's an absurd statement, yes.

10 Q What about the second conclusion?

02:26PM

11 A Second, hypolimnetic withdrawals are not
12 recommended as a means of mitigating THM formation
13 potential because of the presence of deep water
14 maxima arising from production of precursors through
15 microbial decomposition of organic matter, and I
16 would say that that depends upon the reservoir.

02:26PM

17 Q Okay.

18 A We have reservoirs in southern California,
19 particularly Castaic Lake, where the quality of the
20 water below the thermocline is much better than
21 above the thermocline.

02:27PM

22 Q Do you know if that's the case in Lake
23 Tenkiller?

24 A There is a low dissolved oxygen in Lake
25 Tenkiller. I'm just saying that he's making general

02:27PM

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1 -- generalizations, and I can think off the top of
2 my head of one that's -- where it's not true.

3 Q Okay, and the third one?

4 A Third, implementation of best management
5 practices to mitigate nutrient loading likely would
6 diminish THM formation potential by reducing algal
7 abundance in tributaries and other source waters.

02:27PM

8 Q Do you disagree with that statement?

9 A I think it's in conflict with a statement of
10 his earlier, which is listed in my report.

02:27PM

11 Scientific understanding of the links between
12 watershed development and DBPs is poor. So he is
13 summarizing his judgment that I think is not
14 supported by all of the material in his report.

15 Q And is this a peer-reviewed article?

02:28PM

16 A It is.

17 Q Is it published in the American Water Works
18 Association Journal?

19 A It is.

20 Q Is that a reliable journal?

02:28PM

21 A I've published in it. I sure hope so.

22 Q Okay. On Page 57 of your report, you
23 reference U.S. EPA, 2007-A several times at the
24 bottom. I'm going to mark something as Exhibit 12,
25 and --

02:28PM

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1 location of the plume, where do you need to site,
2 capture wells, that kind of thing.

3 Q When that's done, is it based on a concern
4 about risks to human health?

5 MR. JORGENSEN: Objection.

02:33PM

6 A In -- in the particular case of San Gabriel
7 Valley, yes, because that water is extracted and
8 used for drinking purposes. So the levels that were
9 used for treatment of that water were levels
10 established by the state and, indeed, were the MCLs.

02:33PM

11 Q And we may have covered this before. Have you
12 -- have you conducted any scientific or medical
13 research on the health effects of disinfection
14 byproducts?

15 A No.

02:34PM

16 MR. JORGENSEN: Objection.

17 A I'm sorry. Did you hear me? I said no. We
18 -- we spoke over each other..

19 MR. JORGENSEN: I apologize.

20 Q Are you qualified to give opinions on risks to
21 human health from ingesting DBPs?

02:34PM

22 A No.

23 Q Can disinfection byproducts cause taste and
24 odor problems?

25 A Not the disinfection byproducts we're talking

02:34PM